How does Venture Capital Financing Improve Efficiency in Private Firm? A Look Beneath the Surface

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Summary

- Central Questions
  - Do VCs add values?
  - If VCs add values, what are the mechanisms: "screening" and/or "monitoring"?
  - If they add values, what are the economic channels – increase sales, reduce costs, hiring key employees, etc?
- Using the total factor productivity (TFP) as the key metric, this paper tries to answer all of these questions.
- Ambitious Paper; Empirical execution is very well done; thoughtful econometrics; a lot of hard work!

Overview

- VC financing is an extremely complex process
  - There are enormous amount of results in the paper:
    - 37 pages of main text, 12 tables; and 30 Panels in total!

- As a discussant, I will focus on just one set of empirical findings of this paper
  - Need to emphasize what I do not plan to cover is equally interesting

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"I have discovered a truly marvelous proof of this (i.e., Fermat's last theorem), which this margin is too narrow to contain."

- Pierre de Fermat (1637)

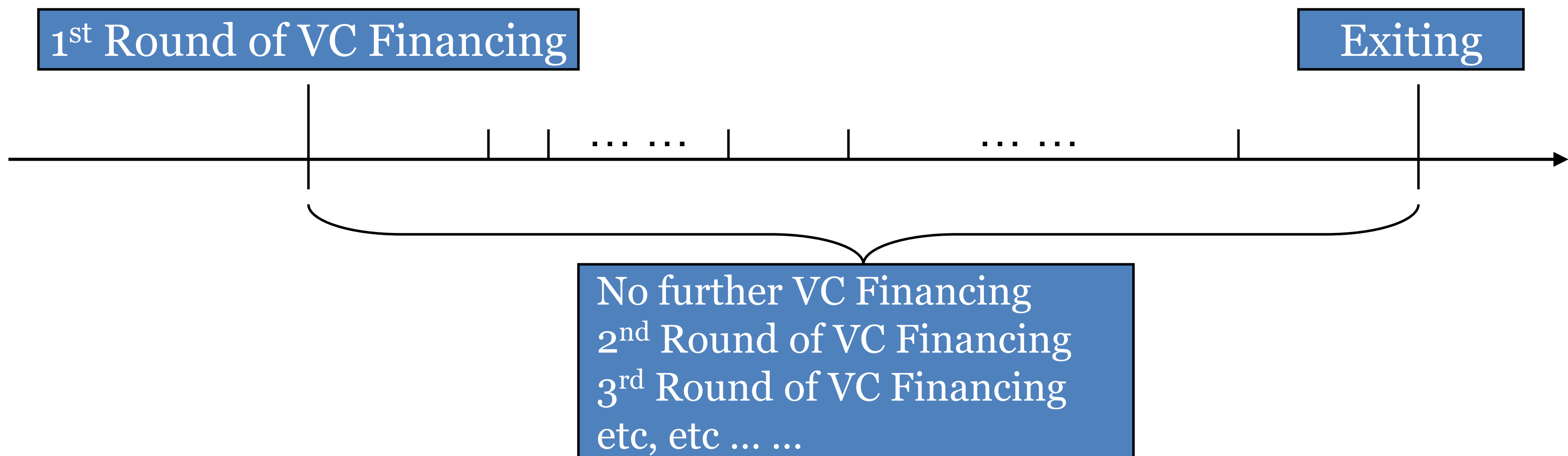

Table 4 shows:

- At the 1st Round of VC Financing
  - VC financed firms have ***higher*** TFP than non-VC financed firms
    - This is consistent with "screening" / "sorting-matching" story
  - Low Reputation VCs finance firms with ***higher*** TFP while High Reputation VCs financed firms with ***lower*** TFP
- After 1st Round of VC Financing
  - High Reputation VC financed firms exhibit ***higher*** TFP than Low Reputation VC financed firms

A Puzzle: High vs. Low Reputation VCs' Choice / Matching with Financing Targets

- This is a set of novel but somewhat puzzling findings
  - They have deep implications for us to think about the value-added of VCs
- For now, let us accept the premise that VC indeed have screening and monitoring skills
- Why don't the high reputation VCs choose high TFP firms (prior to the 1st round of financing) to start with?
  - If high reputation VCs have the monitoring skills, then presumably they can growth the TFP even more

A Puzzle: Deciphering

Table 10 shows:

- Prior to the 1st round of financing, firms eventually receiving financing from low reputation VCs on average have:
  - Lower sales, material costs, wages and salaries, number of employment
  - Higher production costs

Table 12 shows:

- Firms backed by low reputation VCs are likely to exit through M&A/Sales (as opposed to IPOs)

A Puzzle: Deciphering, cont'd

- Take together, it seems fair to say that high reputation and low reputation VCs choose/match with *very different types of firms* at the 1st round of financing

- What types of firms do high/low reputation VCs choose (or match with)?
  - Without looking at the data, I cannot tell
  - But I will make some conjectures

A Puzzle: Some Conjectures

- Do High Reputation VCs more likely to choose/match firms with more growth options?

- Do High Reputation VCs more likely to choose/match firms with early product or industry life cycle?
  - Product / life cycle stage ≠ age: a young firm may still be in a late stage industry /product life cycle

- Do High Reputation VCs more likely to choose/match firms with a large amount of intangibles captured by "Solow's residual" (i.e., TFP)?
  - See: Prescott & Visscher (1980); Lev (2001); Lev & Radhakrishna (2004); Eisfeldt & Papanikolaou (2009)

A Puzzle: Implications for Interpretations of Results

- Why should we care about resolving this puzzle?
  - The authors suggest high reputation VCs have ***better*** monitoring ability

"These results therefore attest to the better monitoring ability of high reputation VCs, who are able to achieve better sales using lower input levels and thus are able to attain higher level of productivity improvement for the firm they invest in." (p. 32)

  - The inference relies on the difference-in-difference type of set up in Table 12
  - However, if the firms backed by high vs. low reputation VCs are systematically different in types, the inference may not be reliable due to the selection effect.
    - Firms back by high reputation VCs grow faster than firms back by low reputation VCs *regardless of better or worse monitoring*

A Thought on Instrumental Variable (IV)

- Table 6: Switching Regression
  - A nice design to consider "counter factual" (Manski, 2004)
  - The key is to find IV in the first stage regression
  - The IV is correlated with firm demand for VC funding but uncorrelated with investment outcome
  - The authors consider several instruments but the primary instrument is "the change of NSF applied research grants"

A Thought on IV

- Comment on the time-series property of the IV
  - This IV is a time-series variable
  - The identification of firms that are in need of VC funding is likely to come to time-series (rather than cross-section)
  - Example #1: firms in need of VC finance in good / bad times, they are probably different in terms of inherent profitability types
  - Example #2: increase in VC fund could increase competition → would this impact profitability?
  - I would check whether there is any systematic difference in profitability / investment outcome for different vintages of VC backed and non VC backed firms

Final Remarks

- This is a well-written paper
  - It asks interesting questions and provides interesting evidence
  - Many of the results were unknown in the literature
  - I very much enjoy reading it and I highly recommend this paper to you.

- It would be very exciting to see answers to some "why" and "why not" questions.
  - Given the richness of the data, I look forward to knowing more about them.